
▲ ***Approximately 275,000 plastic fragments,*** *19,000 rubber gloves, 14,000 milk jugs, and 11,000 balloons were among the items of trash painstakingly recorded and disposed of by staff at Padre Island National Seashore from 1994 to 1998. Data collected over 10 years of trash monitoring suggest that between 21% and 62% of the trash comes from Gulf of Mexico shrimping, while 15% is attributable to offshore oil and gas activities.*

# NPS SCIENCE

The National Park Service plays an important scientific role in fulfilling its resource stewardship mission—acquiring and applying the best and most comprehensive scientific information available to preserve resources and manage park visitors. A portion of that information comes from research obtained from the National Park Service's natural and social science research partners. Equally critical is information collected through its scientific inventory and monitoring activities. Inventories of biological and physical resources account for the presence, class, and distribution of natural resources in parks; long-term monitoring helps to reveal resource condition and detect ecosystem change. Together, inventory and monitoring are potent partners that give early warning of resource degradation. As the stories from 1998 indicate, the scientific functions of the National Park Service, including its technical expertise, are fundamental to the long-term maintenance of natural resources.

## Long-term Monitoring

## SHORELINE STUDIES AT PADRE ISLAND POINT TO TRASH SOURCES

*by John Miller*

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Trash is a problem at beaches throughout the nation. At Padre Island National Seashore, Texas, shoreline trash has become one of the park's foremost natural resource problems. Approximately 90% of all shoreline trash items found at the seashore are made of plastics, in spite of the fact that an international treaty known as MARPOL prohibits dumping trash at sea, with specific restrictions on dumping plastics. Many marine managers across the nation are seeking ways to clearly identify the sources of shoreline trash so they can try to eliminate the dumping problem at the source.

Padre Island might be able to provide some answers. After more than a decade of studying the nature and origin of shoreline trash at the seashore, park resource management staff began analyzing data in 1998 from inventory methods the park pioneered. Padre Island has fine-tuned shoreline trash monitoring techniques and resource management staff have begun to identify the sources of the trash.

For 10 years, resource managers at Padre Island National Seashore have tested shoreline trash collection methods in order to determine the survey frequency and distance needed to provide scientifically valid data. Beginning in 1994, and based on findings from previous studies, the park initiated the "Shoreline Trash Point Source Investigation" to identify the amount of trash washing onto the beach from specific sources. This is one of the first long-term, comprehensive, shoreline trash monitoring projects to be conducted in the United States. The labor-intensive project required daily cataloging and removal of 43 different kinds of trash items from 16 miles of shoreline within the park. Upon completion of the 1998 monitoring season, the park had collected 958 days' worth of marine trash data, cumulatively surveyed more than 12,500 miles of shoreline, and recorded and removed nearly 400,000 trash items.

Statistical analysis of the data shows that surveys conducted one day per week provide information that can be used to predict the amount and kind of trash that will occur for the entire week. Statistical models derived from the data collected also indicate that surveys should be made every 8–10 miles. This means that at Padre Island, collections can be conducted at miles 1, 8, and 16, instead of all miles 1–16.

Additionally, statistical analysis has allowed the park to identify possible sources of the trash. Using data on monthly shrimping efforts provided by the National Marine Fisheries Service, a statistical correlation has been established between Gulf shrimping efforts and the number of specific trash items that wash ashore. A regression

Padre Island National Seashore, Roddy W. Wilder

***Entangled in shrimp netting,*** *an endangered Kemp's ridley sea turtle washed ashore on South Padre Island, south of the park, in 1993, signaling the threat to resources posed by waterborne trash.*

***Medical waste and drums*** *containing a variety of toxins are among the trash items at the park that pose safety hazards to today's visitors.*

model has been developed indicating that increased Gulf shrimping efforts directly correlate with increased numbers of specific types of trash items washing onto the adjacent shoreline.

To solve the marine trash problem, point sources must be identified. Actions implemented to reduce the amount of trash being dumped into our oceans are ineffective if the source is unknown. This shoreline trash study demonstrates that monitoring marine trash can aid in identifying probable point sources. This valuable information will be summarized in a technical report in 1999 and can be used for improving the management of marine resources everywhere.

# WHITE ABALONE: GOING, GOING, GONE? GPRA

*by Gary E. Davis*

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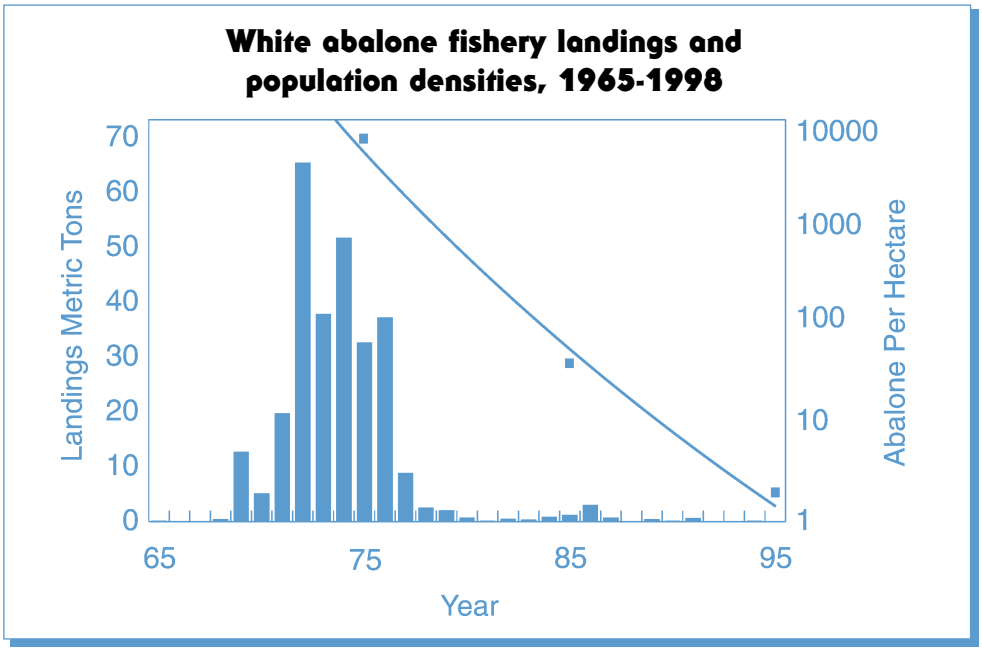
Impossible! Scientifically managed fishing will not cause extinction of fecund marine invertebrates. Everyone believed that imposing size limits, fishing seasons, and restricting take, plus the difficulty of finding the last few animals, would always leave enough surviving white abalone to prevent extinction in the sea. Recent monitoring of these delectable marine snails in Channel Islands National Park, California, challenges this conventional wisdom with disturbing news. Unless people intervene at once, all the white abalone will be gone in a few years.

How could this happen? When other abalone species became hard to find in the 1970s, divers exploring deep reefs discovered abundant white abalone. Average-sized reefs—the size of two soccer fields (1 hectare)—contained 2,000 to 10,000 white abalone at the center of white abalone distribution, the California Channel Islands. Divers took 20 to 60 metric tons (22–66 tons) of white abalone a year until no more legal-sized white abalone were left. By 1980, annual landings of legal catch were only a few kilograms. Biological inventories of the newly expanded Channel Islands National Park in 1980–81 revealed that the remaining white abalone population was down to only 12 per hectare (about 2.5 acres). Subsequent monitoring documented a continuing decline to only one per hectare by the late 1990s. Surveys of the park by submarine in 1996 and 1997 showed that the last few survivors were widely scattered, too far apart to effectively reproduce, and found only large shells, indicating that white abalone last reproduced in the 1960s. Survivors of the legal fishing were so few and so sparsely distributed that significant reproduction has not occurred since the fishery began in the 1970s. Those survivors are now dying of old age, alone on small, isolated deep reefs.

In 1998, scientists, attorneys, fishers, and mariculturists from the United States and Mexico, representing fishing cooperatives, conservation organizations, universities, state and federal agencies, and private enterprise, joined forces to




**Award-Winner Profile**
BOB COOK WINS TRISH PATTERSON–SCA AWARD

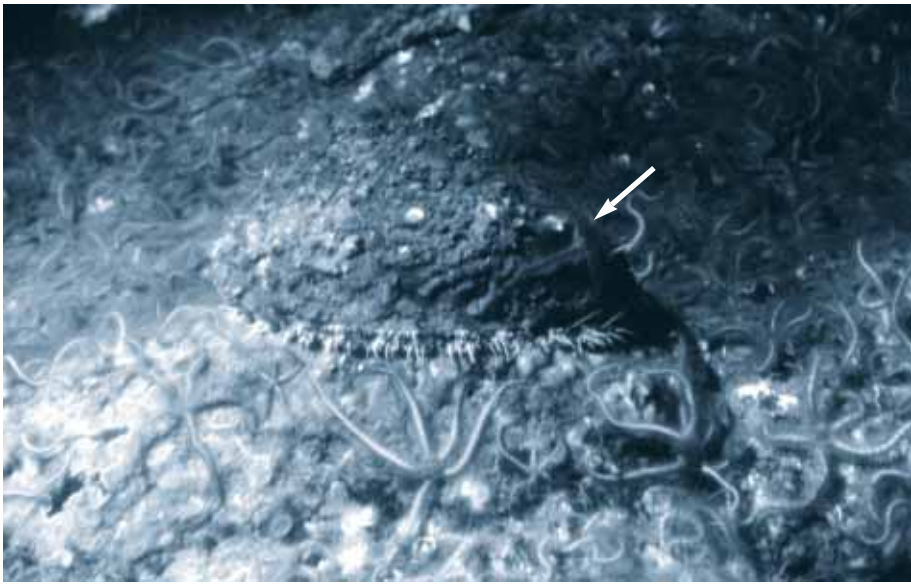
*Given in recognition of resource management excellence in a small park, the Trish Patterson–SCA Award went to Bob Cook in 1998 for his work the previous year at National Park of American Samoa. Bob was the first resource manager to serve at the South Pacific park. From this tropical jungle wilderness, largely unexplored by NPS staff, Bob established an inventory and monitoring program and conducted inventories of freshwater streams, terrestrial snails, and coral reefs. He also collected baseline data on feral pig activity and reviewed the status of the population and habitat of the flying fox fruit bat. As a result, issues affecting park natural resources have been better defined and prioritized. In turn, this led to a broad expansion of the park resource management plan, enhancing the ability of the park to hire a resource management crew to address the top-priority resource issues.*

Natural Resource Information Division

*Bob Cook*

develop a four-step strategy to prevent white abalone extinction and restore the species to a viable condition. Using public education, existing governmental processes, and research, they plan to: (1) locate survivors by surveying historic habitat; (2) collect brood stock; (3) breed and rear a new generation of brood stock in captivity; and (4) reestablish wild populations with refugia in Channel Islands National Park and other protected areas. The National Marine Fisheries Service designated white abalone a candidate for endangered species listing in 1998 and funded a status review for a listing determination.

The condition of white abalone is perilous, but monitoring in the park gave a confident early warning. With persistence and a willingness to explore new ways to care for marine species, there is still hope for restoring them and preventing other losses in the sea.



National Park Service

***Once abundant on deep rocky reefs*** *at Channel Islands, white abalone are now too few and far between to reproduce on their own. Rapid and severe exploitation during the past 25 years has left this mollusk teetering on the brink of extinction. A plan to recover the species is based on laws to protect those remaining, a captive breeding and restoration program, and educational outreach.*

# RIPARIAN MONITORING FOCUSED ON STREAM RECOVERY IN CANYONLANDS

*by Charlie Schelz*

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After nearly 50 years of use, the road above Peekaboo Camp in Salt Creek of the Needles District of Canyonlands National Park (Utah) was closed to vehicles in 1998. The rough, four-wheel-drive route ran in and across the creek in many places and provided access to Angel Arch, a popular destination 12 miles from the trailhead. The closure is the result of a lawsuit brought by a wilderness advocacy group to reverse a park decision to allow limited vehicular use of the road. In 1992 the park began a backcountry use planning process and examined the long-standing policy of unrestricted use of the Salt Creek road. The issue is a classic example of balancing resource use and preservation. Although the preferred alternative in the environmental assessment for the backcountry management plan was for road closure, the park decided to limit use through a permit system. The court overturned that decision last July.

Salt Creek is the only perennial stream in the park besides the Colorado and Green Rivers. It has been the subject of three studies by various independent researchers who attempted to determine the effects of vehicular traffic on the ecosystem. All of these studies, although neither well funded nor extensive, found deleterious ecological effects of the road and its use. The extensive literature on the effects of such roads on ecosystem processes has also shown many negative consequences, especially in arid environments. These include increased erosion, habitat destruction, soil and water pollution, noise pollution, exotic invasions, and wildlife elimination and dispersion.

With the road now closed and left to the forces of nature, the park Division of Resource Management has initiated a riparian monitoring program to document ecological change and natural recovery in Salt Creek. In 1998, the park established 12 permanent plots in Salt Creek that record biological, hydrologic, erosion, and vegetation features as they appear now. The park plans to measure these same features again in the future, possibly every three to five years. It also plans to establish plots in the section of Salt Creek that is still open to vehicles and in similar adjacent canyons.

The monitoring program has many objectives and methods. First, the park wants to determine any change in vegetation composition, cover, and structure at each plot using a cross-sectional, line-intersect method. The park plans to measure, photograph, and map stream channel characteristics. Permanent panoramic photo-points will be set up above and in the stream channel at each plot. Aquatic macroinvertebrate populations will be

Southeast Utah Group, Charlie Schelz

***Located in the Needles District*** *of Canyonlands National Park, the scenic four-wheel-drive road to Angel Arch was closed to vehicles in 1998. The area is now the site of resource monitoring designed to increase ecological understanding of riparian recovery in an arid landscape following disturbance.*

monitored along both open and closed sections of the road, and a permanent bird survey transect will be set up in the closed section of Salt Creek. Amphibian and insect surveys may also be added in 1999. Finally, the park plans a Riparian Functioning Condition Analysis, developed by the Bureau of Land Management, at each site to assess the quality of the riparian condition by examining vegetation, hydrology, and erosion.

This study is the first of its kind in the semiarid environment of the Colorado Plateau. Now in its infancy, the monitoring program is envisioned as long-term and will add much to the ecological understanding of riparian recovery and change in an arid environment following disturbance.

YOSEMITE PLANS CONSOLIDATED

*In December, Interior Secretary Babbitt called for pulling together the Yosemite Valley Implementation Plan, Yosemite Valley Housing Plan, Yosemite Valley Lodge Development Concept Plan, and Lower Yosemite Falls project into one comprehensive plan with an environmental impact statement. Slated for 2000, this plan will build on the park General Management Plan in shaping the future of Yosemite Valley by restoring natural and cultural resources, balancing use and preservation, and reducing traffic congestion and overcrowding.*

## Planning and Preservation

# SCIENCE-BASED PLANNING AT TALLGRASS PRAIRIE NATIONAL PRESERVE

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In spring 1997, a volunteer team of park and program professionals from across the Midwest Region met to begin the development of a general management plan/environmental impact statement for the newly established Tallgrass Prairie National Preserve. The team took advantage of the lack of resource management precedents at the new preserve and developed a plan that uses good science as its basic building block.

It was clear from the very beginning that resource management at the preserve would be challenging. The National Park Service can own only up to 180 acres of the 10,894-acre preserve, located in the Flint Hills of Kansas. The current owner is the National Park Trust. Ninety-eight percent of the land base will remain in private ownership, making partnerships and consensus-building essential to effective management. Currently, a 35-year grazing lease is in effect, which is managed by early, intensive double-stocking of cattle and the burning of every leased acre each spring. The area also has a 30-well active gas lease in operation. In addition, the preserve lacks site-specific baseline data on natural resources before 1996.

In order to generate a successful management plan, the team had to clearly understand and adhere to the legislation that established the preserve. This legislation

emphasizes several key features, such as the development of a general management plan within four years, maintenance and enhancement of the tallgrass prairie, specific interpretive themes, establishment of a 13-member advisory committee, a ceiling of 180 acres for NPS landownership, and the need for a cooperative agreement between the property owner and the National Park Service.

To get buy-in by all interested parties, the planning team had to build a broad consensus through public involvement. Public input was gathered through a series of newsletters, open house meetings, an Internet site, and the participation of individuals and organizations representing various interests in the planning process.

To develop the nuts-and-bolts resource management aspects of the plan, the team had to develop and use good science that was useful to management and could stand up to public scrutiny. The team collected some baseline data, but because of the short time frame given to develop the general management plan and the limited funds, data also had to be extrapolated from scientific databases that feature information from other studies in tallgrass prairie ecosystems. Answers to many of the basic science questions were provided by panels of subject matter experts charged with the task of addressing needs for the general management plan. Technical experts from other federal and state agencies provided additional information.

As a result of these efforts, Tallgrass Prairie National Preserve has a draft preferred alternative that, after consultation and public review and comment, will ensure that natural resources always come first. The opportunity to start from scratch has yielded a unique plan that can serve as a model for other natural resource parks.

Geologic Resources Division

***The Tallgrass Prairie planning team*** *inventoried resources, including approximately 30 natural gas wells inside the boundary of the new preserve.*

# RECURRENT THEMES OF WATER RESOURCES MANAGEMENT PLANS

*by David L. Vana-Miller*

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Aquatic ecosystems play a central role in the social, economic, environmental, and political mosaic of units of the national park system. Scientists and managers are increasingly called upon to respond to disruptions of water resources that threaten the quality of human life and environmental sustainability. However, fewer than 9% of those parks with significant water resources have some type of water specialist on staff. For the remaining parks, the development of water resources management plans can assist in the development of a parkwide strategy to ensure that park managers and policy makers have adequate and timely information to protect, use, and enhance water resources. A water resources management plan identifies high-priority management and research areas and proposes a conceptual framework for building a comprehensive, integrated, and durable water management program that will position a park to address the issues of the next century in a realistic manner.

> "... fewer than 9% of those parks with significant water resources have some type of water specialist on staff."

During 1998 the Water Resources Planning Program,

***The water resource management planning process*** *illuminates water resource issues in parks, such as the effects of oil and gas infrastructure and activities, and is the basis for better management of these resources.*


*Padre Island National Seashore (Texas) by Geologic Resources Division*

## WETLAND PROTECTION STRENGTHENED

*A new set of wetland protection procedures was issued in 1998 in* Director's Order #77-1: Wetland Protection *and an accompanying manual. Last updated in 1980, the guidance identifies those procedures that work well and those that are ineffective. In particular, wetland protection is strengthened through wetland inventory requirements and procedures for avoiding, minimizing, or compensating for wetland impacts during restoration activities. Additionally, the procedures eliminate unnecessary paperwork and review for projects that have a negligible effect on wetlands.*

## GEOLOGY LINKED TO RESOURCE PROTECTION

*A geologic map produced in 1998 by a Mesa Verde National Park (Colorado) volunteer shows how rock type prescribed the location of the cliff dwellings at the park and influences the distribution of threatened and endangered plants. Both associations are important in the preservation of these resources.*

initiated by the NPS Water Resources Division in 1991, completed water resources management plans for Cape Cod National Seashore, Theodore Roosevelt National Park, Obed Wild and Scenic River, and Chickasaw National Recreation Area. Although these parks have obvious hydro-ecological differences, the water resources management plans, taken together, continue to demonstrate recurrent themes of plans completed during the last several years. These themes include the following:

- Effective managerial solutions to problems concerning water resources will be achieved only with the understanding that changes in environmental conditions are directly linked to socioeconomic patterns and processes, especially land use.
- Interactive partnerships among policy makers, hydrologists, and park resource managers are essential for developing a comprehensive approach to integrating water sciences with management of water resources.
- Viewing water problems holistically and integrating management and research needs into a watershed context link the sciences involved in water research and management.
- The transfer of scientific information to regional and local leaders and the public should be done in a manner that will produce an informed and responsive citizenry who are willing and able to provide direct feedback on water-based programs.
- Proposed recommendations are seemingly connected to issues that are related directly to societal needs, namely restoring and rehabilitating ecosystems, maintaining biodiversity, and understanding the effects of modified hydrologic flow.

In all likelihood, these same themes will continue to appear in future water resources management plans; they are ultimately the foundation for any water resource management program. However, the development of water resources management plans is limited by resource constraints. To date, water resources management plans have been completed for 27 parks, representing only 10% of parks with significant water resources. Nonetheless, these parks have benefited in several ways from their water resources management plans. For example, they obtained approximately 40% of available funding from one competitive program because proposed water resource management actions, developed in their plans, were well thought-out and firmly grounded in science. Clearly the road is long, but the task is not daunting.

## Resource Inventory

# PROGRAM CENTER TAKES ON GEOLOGIC INVENTORIES GPRA

*by Bruce Heise and Joe Gregson*


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In 1998 the Natural Resource Program Center completed the first phase of a pilot project ultimately intended to inventory the geologic resources of the national parks. Preliminary findings of the pilot Geologic Resources Inventory suggest several applications for overall park resource management from an enhanced understanding of the parks' geology. Examples include the use of geologic data to construct fire histories, identify habitat for rare and endangered plant species, identify areas with cultural resources and potential for paleontological resources, and locate potential hazards for park roads, facilities, and visitors. Digital geologic maps will enhance the ability of managers to develop precise hazard and resource models in conjunction with other digital data.

The inventory, conducted jointly by the national Inventory and Monitoring Program and the Geologic Resources Division, stems from the 1997 NPS Strategic Plan, which recognized a geologic map as one of 12 essential data sets for parks. National Park Service, U.S. Geological Survey, and state geologists subsequently identified a park systemwide inventory as a critical first step for managing, interpreting, and understanding the geologic resources in the parks. The group determined that an inventory should consist of these four components:

1. a bibliography of geologic literature and maps,
2. an evaluation of park geologic resources and issues,
3. an assessment of geologic map coverage and production of digital products, and
4. a report describing the park's geology.

Because of their proximity to the offices of the Natural Resource Program Center and the U.S. Geological Survey, the Colorado parks were selected for the first series of scoping sessions necessary to assess the quality and extent of geologic information available for each park. Each session included a field trip led by an authority on park geology, followed by an on-site meeting dedicated to reviewing the four inventory items listed. Each meeting ended with a summary session to determine inventory needs and deliverables and to tentatively assign cooperator responsibilities.

These sessions have been successful in evaluating the issues and resources at each park, gaining program understanding and cooperation, and maximizing returns from existing projects and knowledge. The Geologic Resources Inventory team plans to complete production of products for Colorado parks and to move on to additional pilot work in Utah in FY 1999.


***The pilot geologic inventory*** *of Colorado parks identified park needs for geologic products and facilitated their development, including this digital geologic map (1:24,000) of a portion of Curecanti National Recreation Area. To develop the map, an NPS technician digitized the 1971 Geologic Map of the Black Canyon of the Gunnison River and Vicinity by the U.S. Geological Survey. The map is now available in a Geographic Information Systems format that can easily be used in management applications.*

NEOTROPICAL MIGRANTS

*Forty round-trip plane tickets were donated to the National Park Service by American Airlines in 1998 to promote dialogue among park managers in Latin America and the United States. Resource managers now have a better chance of meeting face-to-face to coordinate strategies for the protection of wintering and breeding habitats of long-distance migrants such as birds and bats. An ad campaign for the airline will publicize the complex international conservation issue regarding Neotropical migrants by stating, "Everyone needs a place to land."*

# BATS SURVEYED AT GRAND CANYON

*by Elaine Leslie*

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Grand Canyon National Park (Arizona) is an expansive area that is home to a diversity of wildlife, including as many as 10 bat species that are candidates for federal protection under the Endangered Species Act. Because of the park's range in elevation and habitats from mixed conifer forests to desert and river environments, it hosts both boreal and southern bat species. Following an initial inventory of bat species along the river corridor in 1996 and 1997, the park, in cooperation with Bat Conservation International, Inc. (BCI), dedicated efforts and funding to complete the river inventory, begin forest surveys, and establish long-term monitoring goals.

Before the 1996 and 1997 inventories, the most recent bat species list (1978) compiled for the river corridor included only seven species. Survey methods used in the 1998 follow-up inventory included traditional mist netting, use of harp traps, and cave exit counts, in addition to the Anabat system. This technique, which employs a bat detector that transforms ultrasound to an audible output, enables users to identify bat species. Through this combination of methods, the 1998 surveys more than doubled the 1978 figures by adding nine new species, including spotted, silver-haired, hoary, western mastiff, Mexican long-tongued, red, and big free-tailed bats.

Monitoring of cave populations of Townsend's big-eared bats, western mastiff bats, and Mexican free-tailed bats has proven crucial in the recovery of these maternity and roosting colonies. Surveys detected declines in, or a complete absence of, populations that are known to have existed in cave systems throughout the park. In 1996 the park erected a bat-navigable gate over the entrance to Stanton's Cave, the location of a maternity roost of Townsend's big-eared bats that had been repeatedly disturbed by years of archeological excavations and visitor day-use. The population has since recovered from just a few individuals to nearly 80! Monitoring plans for 1999–2000 include collecting more data on migratory species such as the Mexican free-tailed bat. Grand Canyon National Park hosts the largest colony of this species in Arizona, and although the park affords habitat protection during the breeding season for this migratory species, little is known about the habitat in Mexico upon which it depends for overwintering. Future plans include looking beyond park boundaries with the goal of securing partnerships for the preservation of overwintering habitat.

The Grand Canyon surveys and monitoring efforts have yielded not only invaluable information but also a wide range of concerns. The park provides abundant roosting and foraging habitat for bats, from extensive cave and fissure systems to old-growth forest; however, recreationists prefer the same areas favored by bats. Thus, the disturbance of critical habitat is being addressed in the implementation of various park management plans (e.g., Colorado River Management Plan, Cave Management Plan, and Backcountry Management Plan). Future monitoring of bat populations and distribution, and analysis of the new baseline, will enable resource managers to recommend sound management actions.

In continuing efforts to protect the world's resources, nothing is more important than transforming data into knowledge. Communicating this knowledge to an informed and supportive public will afford the best long-term protection and preservation of sensitive natural resources, including the bat species of Grand Canyon National Park.

***The big-eared bat*** *was one of 16 bat species documented in recent surveys along the Colorado River in Grand Canyon National Park. Surveys such as these establish baselines for comparing with future conditions and serve as a basis for scientific decision making.*

## Social Sciences

# SURVEY RESEARCH PROVIDES MANAGEMENT INFORMATION GPRA

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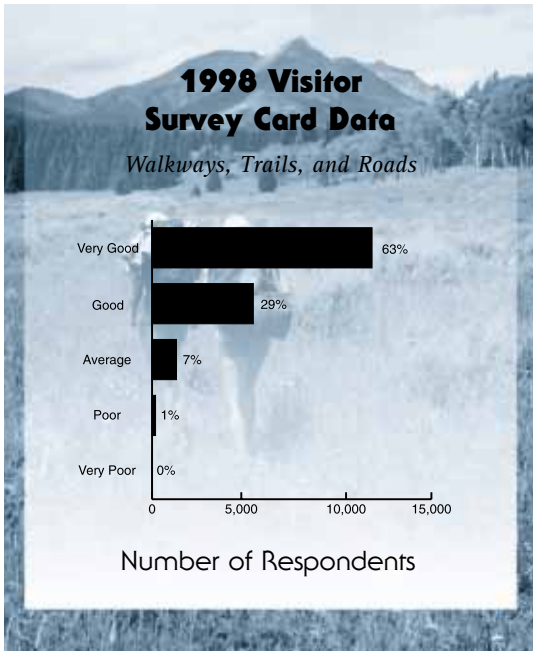
To effectively balance resource preservation with visitor use, NPS managers must understand public values, attitudes, and behaviors regarding the national park system. Survey research is an important tool for achieving this understanding. In 1998 the National Park Service sponsored surveys related to fees, Government Performance and Results Act (GPRA) standards, visitor use, gateway communities, and more.

**FEE DEMONSTRATION PROGRAM SURVEY** The National Park Service is supporting a sustained program of survey research conducted by various universities to monitor and understand response to the Fee Demonstration Program. The research is supported by funds from newly instituted recreation fees. Results from a 1997–98 visitor survey consistently indicate that park visitors generally support the new fees, provided the funds remain in the park or with the National Park Service. Also, managers at the 100 fee demonstration parks were surveyed about fee collections and their impact on park operations.

**GPRA SURVEY** In 1998 the Visitor Survey Card was developed to help the National Park Service comply with GPRA. Distributed in 310 units of the park system, the survey card measured each park's performance related to GPRA goals concerning visitor satisfaction and visitor understanding and appreciation of park values. The survey results have been published for each unit, cluster, and region.

**VISITOR USE SURVEYS** The Visitor Services Project conducts approximately 10 detailed visitor studies per year. Since 1988 this project has completed nearly 100 studies; produced an annual report, *Serving the Visitor*; and created a national database of all survey responses. The Visitor Services Project studies completed in 1998 include Jean Lafitte National Historical Park and Preserve, Acadia National Park, Whiskeytown National Recreation Area, and others. Park staff use the data in planning, operations, and policy making. For example, Jean Lafitte staff are using the study to help identify transportation needs.




***The Visitor Survey Card*** *reports results pertinent to the Government Performance and Results Act for visitor satisfaction and visitor understanding and appreciation of park resources. Data are based on 21,696 visitor responses from surveys conducted at 281 parks. The satisfaction measure is the combined percentages of "very good" and "good" responses. The evaluation score is based on a range from "very poor" = 1 to "very good" = 5.*

During 1998, researchers conducted additional survey research throughout the National Park Service. Examples include general visitor studies completed at Mount Rushmore National Memorial, Yosemite National Park, Statue of Liberty National Monument, and Alcatraz Island, part of Golden Gate National Recreation Area. A landowner/visitor use study at Great Egg Harbor Scenic and Recreational River and a gateway communities study at Sequoia–Kings Canyon were also conducted.

Additional survey research is planned for 1999. Examples include continued research related to the Fee Demonstration Program and new studies of fees and backcountry users, a revised Visitor Survey Card, 10 new Visitor Services Project studies, a public opinion survey, and socioeconomic studies of winter use and bison management at Yellowstone. Social science survey research like this will continue to provide park managers with critical information about visitors and local communities, both to help protect park resources and to provide for visitor enjoyment.

### SURVEY APPROVALS OPTIMIZED

*Visitor surveys require approval of the Office of Management and Budget, and the typical approval process can last up to six months. Recently the National Park Service, together with the Department of the Interior and the Office of Management and Budget, developed a proposal to streamline approvals as an exercise in "reinventing government." A three-year pilot effort was launched in 1998 that will dramatically reduce the approval period for most visitor surveys, saving significant time and money.*